



USER GUIDE



EZ Connect Powerline™
200Mbps HomePlug AV Adapter

SMCHPAV-ETH

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Compliances

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices) any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

EC Declaration of Conformity

SMC contact for these products in Europe is:

SMC Networks Spain, S.L.

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This product indicates compliance with the Essential Requirements of the EMC Directive (2004/108/EC) and the LVD Directive (2006/95/EC) of the European Union. This equipment meets the following conformance standards.

EN 55022:2006 CISPR/I/XX/CDV Opt B

EN 61000-3-2 : 2006

EN 61000-3-3 : 1995+A1:2001+A2:2005

EN 55024: 1998+A1:2001+A2:2003

IEC 61000-4-2: 1995+A1:1998+A2:2000; IEC 61000-4-3:2006; IEC 61000-4-4: 2004;

IEC 61000-4-5: 2005; IEC61000-4-6:2007; IEC61000-4-8:1993+A1:2000;

IEC 61000-4-11: 2004

EN 60950-1: 2006

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PREFACE

This document describes the installation of the SMCHPAV-ETH device.

Please read this document before installing the product.

This publication contains the following sections:

- Important safety instructions
- The first thing you need to know before you begin to install
- Product installation guide
- Specification

IMPORTANT SAFETY INSTRUCTIONS

This product is intended for connection to the AC power line. For installation instructions, please refer to the Installation section. For removing the device, refer to the Unplug section. The following precautions should be considered when using this product.

-
- Please read all instructions before installing and operating this product.
 - Please keep all instructions for later reference.
 - Please follow all warnings and instructions marked on the product.
 - **Unplug the powerline adapter from the power outlet before cleaning the product. Use a damp cloth for cleaning. DO NOT use liquid or aerosol cleaners.**
 - **DO NOT** operate this product near water.
-
- This product should **never** be placed near or over a radiator, or heat register.
 - This product relies on the building's electrical installation for short-circuit (over current) protection.
 - Ensure that a fuse or circuit breaker **no larger than 120VAC/20A or 240VAC/16A** is used on the phase conductors (all current-carrying conductors).
 - **DO NOT** allow anything to rest on the product interconnect cords. **DO NOT** install this product where people may walk on the cords.
 - Because the SMCHPAV-ETH device sends data over the powerline, it is recommended that you plug it directly into a power outlet. Do not plug the device into a UPS or power strip with surge protection. The SMCHPAV-ETH device has its own power filter for protection against surges.
 - The product can be operated at an ambient temperature of 40°C.
 - For pluggable equipment, the socket-outlet shall be installed near the equipment and shall be easily accessible.

- **Only** a qualified technician should service this product. Opening or removing covers may result in exposure to dangerous voltage points or other risks.
- Unplug the powerline adapter from the power outlet and refer the product to qualified service personnel for the following conditions:
 - When the interconnect cords are damaged or frayed.
 - If liquid has been spilled into the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed.
 - If the product shows a distinct change in performance.

Chapter 1. Installation notice

The first thing you need to know before you begin to install.....

1. Before installing, make sure your PC meets these requirements for hardware installation:

- Microsoft Windows® 98SE, ME, 2000, XP, Vista, Mac OS or Linux OS
 - Pentium® III or better, clock rate faster than 2.0GHz recommended
 - Resource on your PC
 - At least one free Ethernet port for SMCHPAV-ETH device
-

2. Your PC must not be configured for another network. This means that:

- No network clients except for Microsoft Network*, Client for Netware* Networks, or Microsoft Family Logon* are installed
 - No network services except file and printer sharing for Microsoft Networks or Personal Web Server* are installed
 - No network protocols except Microsoft's TCP/IP, IPX/SPX, NetBEUI, or Net BIOS support for IPX/SPX are installed
-

3. Network installation requires two steps:

1. Install the SMCHPAV-ETH device
 2. For each PC to be added to the network, repeat the process
-

4. Check that you have the following parts for each PC on the network:

Quick installation guide for SMCHPAV-ETH device:

1. SMCHPAV-ETH device
 2. Ethernet Cable (CAT 5)
-

5. Familiarize yourself with the Powerline device connections:

There is only one Ethernet port. This is used for the connection with PC, xDSL Router, Cable Modem, or Wireless AP.

6. Limitation of the PLC device:

To meet the safety regulation, the longest distance between powerline devices is limited to 100 meter and for in-house use only. More than 100 meter will cause the signal reduction or data loss.

Chapter 2. Product Installation Guide

Important:

Do not plug the device into a power strip or surge protector because these devices may consist of filter and impair signal. Also avoid plugging the device right next to noisy sources such as cell phone charger, Halogen light, Energy saving bulb, noisy desktop computer, vacuum cleaner, etc. Both cases result in poor transmission speed.

2.1 Installing the local powerline network

1. Use the supplied Category 5 Ethernet cable to connect the SMCHPAV-ETH to your PC's Ethernet port.
2. Plug the SMCHPAV-ETH device to an AC power outlet.
3. The Power LED indicator will light on after plugging.
4. You can repeat steps 1 and 2 for connecting the more powerline devices
5. The Link LED indicator starts blinking when the data communication proceeds on the Powerline network.
6. The Ethernet LED indicator starts blinking when the data communication proceeds on the Ethernet network.

2.2 Sharing a xDSL or cable modem Internet connection

1. Connect one SMCHPAV-ETH device to your broadband xDSL/ Cable Router
 - Plug the SMCHPAV-ETH into an AC power outlet.
 - Plug the provided Ethernet cable into the RJ45 connector of SMCHPAV-ETH and plug the other end of the cable into an available Ethernet port of the broadband router.
2. Connect the other SMCHPAV-ETH device(s) to the PC(s) to share the Internet connection
 - Plug the SMCHPAV-ETH device into an AC power outlet.
 - Plug the provided Ethernet cable into the RJ45 connector of SMCHPAV-ETH and plug the other end of the cable into an available Ethernet port of the PC.

2.3 Extending a wireless network with powerline to share an Internet connection

1. Connect one SMCHPAV-ETH device to the broadband router
 - Plug the SMCHPAV-ETH into an AC power outlet.
 - Plug the provided Ethernet cable into the RJ45 connector of SMCHPAV-ETH and plug the other end of the cable into an available Ethernet port of the broadband router.
2. Connect the other SMCHPAV-ETH adapter to the wireless Access Point (AP)
 - Plug the SMCHPAV-ETH device into an AC power outlet.
 - Plug the provided Ethernet cable into the RJ45 connector of SMCHAV-ETH and plug the other end of the cable into the Ethernet port on the wireless AP.

Chapter 3. Utility

This Windows utility enables users to find the SMCHPAV-ETH on the Powerline network, measures data transfer rates, ensures privacy and performs diagnostics.

3.1 System Requirements

Operation System	Microsoft Windows® 2000, XP, Vista
CPU	Intel Pentium III or better, clock rate faster than 2.0GHz recommended
RAM	Minimum 128MB
Free Disk Space	Minimum 20MB
Network Interface	One Fast Ethernet (10/100Mbps) network card with RJ45 port, one RJ45 Ethernet cable

3.2 Installation

- Step1.** Before installing this utility, please verify that there is no any other Powerline utility installed on your computer. If there is another utility installed, please uninstall it and restart your computer before installing the SMCHPAV-ETH utility.
- Step 2.** Please insert the SMCHPAV-ETH CD-ROM into your computer's CD-ROM drive. Go to the **SMCHPAV-ETH** directory and double-click **Setup.exe** to start the installation. Then the following screens will appear (See Figure 1).

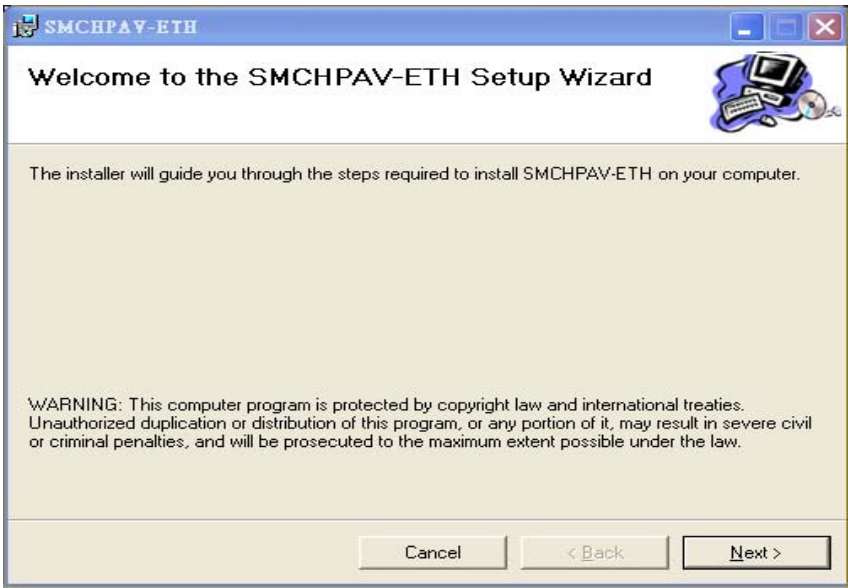


Figure 1.Installation Browser Snapshot

- Step 3.** Follow the steps to install this utility by clicking **Next >**. No password or CD-key is required for installation.

3.3 Running the Utility

After installing the utility, please run it from the Start/All Programs menu or double click the utility icon on the desktop. Figure 2 shows the main screen of the utility. This screen shows a SMCHPAV-ETH connected as local device and another SMCHPAV-ETH connected as remote device.

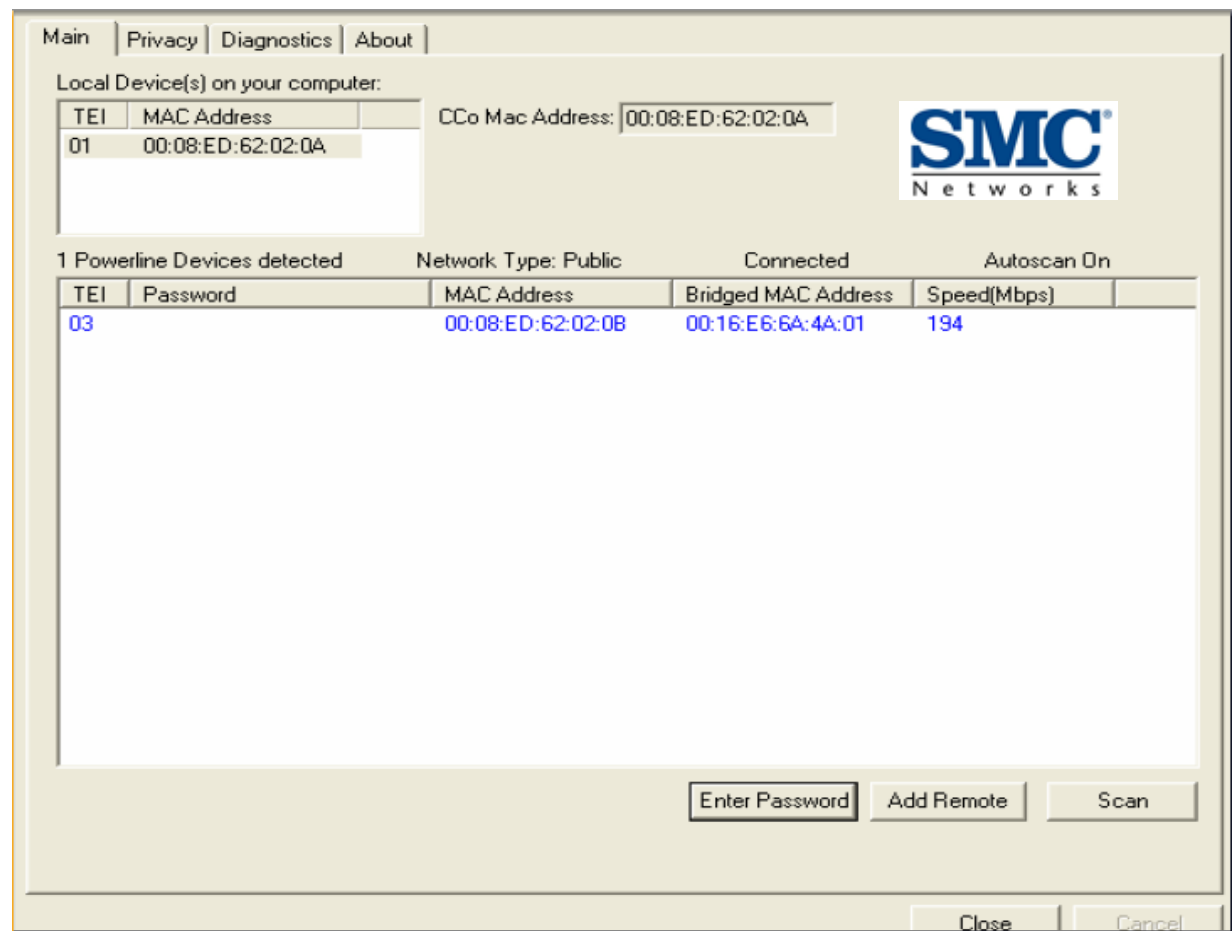


Figure 2. The Main Tab Screen

3.4 How to use

3.4.1. Main Tab

The **Main** tab lists all SMCHPAV-ETH devices that are currently logically connected to the available powerline network. See chapter 3.4.2 on “privacy” to learn more about logical powerline networks.

Upper Window

The upper window, entitled “Local Device(s) on your computer”, shows all the local SMCHPAV-ETH devices directly connected to your computer via Ethernet. In most cases, there is only one device shown in the upper window. If you have more than one NIC (Network Interface Card) on your computer and each of them connects SMCHPAV-ETH devices, you will find more than one local powerline device shown in the upper window. The utility will scan the Powerline network periodically to search for all SMCHPAV-ETH devices and keep the information updated.

CCo MAC Address

This window shows the Hardware MAC Address of the “CCo”(Central Coordinator) of this Powerline network. The CCo is automatically appointed by the Powerline network and cannot be changed unless the original CCo is unplugged.

Lower Window

The lower window lists all the SMCHPAV-ETH devices discovered in the current logical Powerline network. This window will report each powerline device’s connection status, as shown in Figure 2.

TEI	The TEI shows the unique “Terminal Equipment Identifier” of each SMCHPAV-ETH inside the Powerline network. The TEI is automatically defined by the Powerline network and cannot be changed unless the device is unplugged.
Password	Shows the password for each SMCHPAV-ETH on the network. You can add or change the password by selecting a device and clicking the “Enter Password” button.
MAC Address	Shows the Hardware MAC Address for each SMCHPAV-ETH on the network.
Bridged MAC Address	Shows the Hardware MAC Address of the NIC that the SMCHPAV-ETH connects to. If it’s not connected to a NIC, its default value is “ff:ff:ff:ff:ff:ff”.
Speed(Mbps)	Shows the data transfer speed between the remote device and the local device in Mbps (Million bits per second)

“Enter password” button

If you’d like to create a secure private network, you need to enter the password for the devices. Please click on the device you want to add a password for and click the “Enter Password” button. The “Set Device Password” dialog box will show up (Figure 3).

The TEI and MAC address of the selected device are shown in the dialog box. After entering the password, click “OK” button. You can find the password for each device on the backside of the device. The password typically appears as a number and letter code, in groups of four, separated by dashes. If the input password does not match the device’s real password, an error message will appear and you need to try again.



The dialog box titled "Set Device Password" has a blue header bar. It contains three labels on the left: "TEI:", "Mac Addr:", and "Password:". The "TEI:" field has the value "04". The "Mac Addr:" field has the value "00:08:ED:F0:61:0C". The "Password:" field is an empty text box. To the right of the text boxes, there is explanatory text: "The Password typically appears as a number and letter code, in groups of four, separated by dashes. (ie XK8Y-GH26-BR1K-LZSA) It is found on the device or packaging." At the bottom right, there are two buttons: "OK" and "Cancel".

Figure 3. Set Device Password

“Add Remote” button

The “Add Remote” button is used to add a remote device which is not listed in the lower window to your logical network (for example, a device is currently in another logical network). The dialog box in Figure 4 is shown after clicking the “Add Remote” button, and it allows you to enter both, the device name and the password of the remote device you want to add. The device will be added to your logical network only if the Network Name (see chapter 3.4.2) and Password (see password on the device label) are both correct. Like the “Enter Password” function, incorrect passwords will be warned and denied.



The dialog box titled "Add/Remove Device to Network" has a blue header bar. It contains two labels on the left: "Network Name:" and "Password:". The "Network Name:" field has the value "HomePlugAV". The "Password:" field has the value "PASS-WORD-GOES-HERE". To the right of the text boxes, there is explanatory text: "The Password typically appears as a number and letter code, in groups of four, separated by dashes. (ie XK8Y-GH26-BR1K-LZSA) It is found on the device or packaging." At the bottom right, there are two buttons: "OK" and "Cancel".

Figure 4. Add Remote Device

“Scan” button

The “Scan” button is used to immediately search for SMCHPAV-ETH devices connected to your logical network. By default setting, it will automatically scan every 10 seconds and update the display lists accordingly.

3.4.2 Privacy Tab

By factory default, every SMCHPAV-ETH device carries a default logical network name: “HomePlug AV”. The “Privacy” tab provides functions to manage this logical network name and create private network.

“Use Default (Public Network)” button

You can directly set the network name back to factory default “HomePlug AV” by clicking the “Use Default (Public Network)” button first, and then clicking the “Set Local Device Only” or “Set All Devices” button.

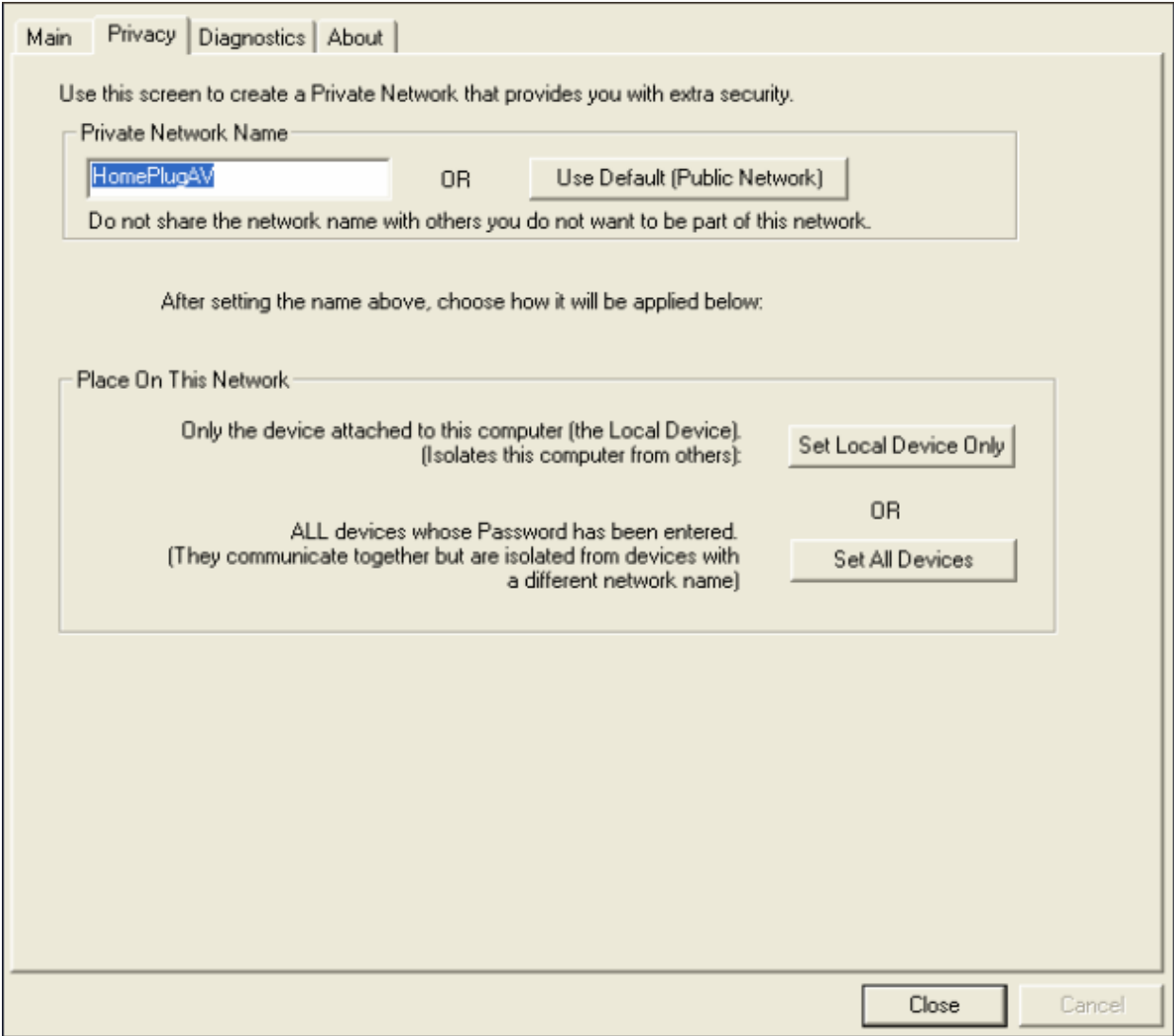


Figure 5. The Privacy Tab Screen

“Set Local Device Only” button

The “Set Local Device Only” button is used to change the network name of the local device only. After changing the network name to a new one, all the devices existing in the same network before will no longer be able to communicate or respond to you because they will not have the same network name within the local device.

“Set All Devices” button

The “Set All Devices” button is used to change the network name of all devices in the logical networks, both local and remote, that are shown in the Main Tab. Please enter the password for remote devices in advance, following the instructions in “Enter Password” button to ensure that this function can proceed normally.

3.4.3 Diagnostics Tab

The “Diagnostics” tab shows the system information and the history of all devices that have been found before in the logical network (Figure 6).

The **upper window** of the Diagnostics tab shows the host computer’s system information:

- MAC Address of all NICs (network interface card)
- MAC Address and the firmware version of the SMCHPAV-ETH device which is connected to each NIC.
- Computer name
- User name
- Processor and operating system information
- Utility version
- Versions of all the driver DLLs and libraries used

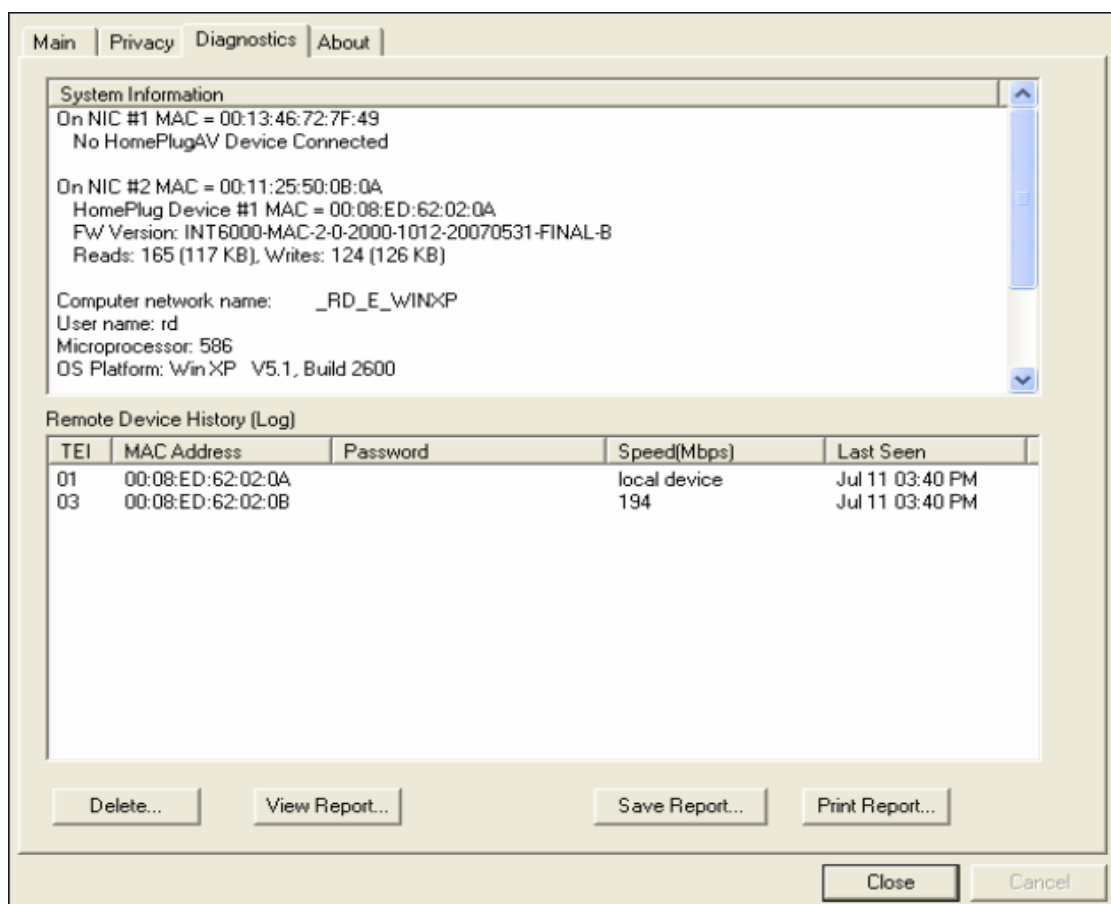


Figure 6. The Diagnostics Tab Screen

The lower window of Diagnostics tab contains the history of all remote devices which have been found by the computer previously. All the devices will be shown here, regardless whether they are currently active or not. The following information is available from the list:

- TEI (Terminal Equipment Identifier)
- MAC Address
- Password
- Speed(Mbps)
- Last Seen

The diagnostics information displayed on the upper and lower window could be saved to a text file or printed out by printers. Devices which no longer exist in the logical network can be deleted using the “Delete...” button.

“Delete...”button

Select the device that no longer exists in the logical network by clicking its record, and then click this button to delete the record.

“View Report...” button

Click this button to view all the device information displayed on the upper and lower window in the default text editor.

“Save Report...” button

Click this button to save all the device information displayed on the upper and lower window to a text file.

“Print Report...” button

Click this button to print the all diagnostics information to your default printer.

3.4.4 About Tab

The “About” Tab shows the software version and manufacturer information.

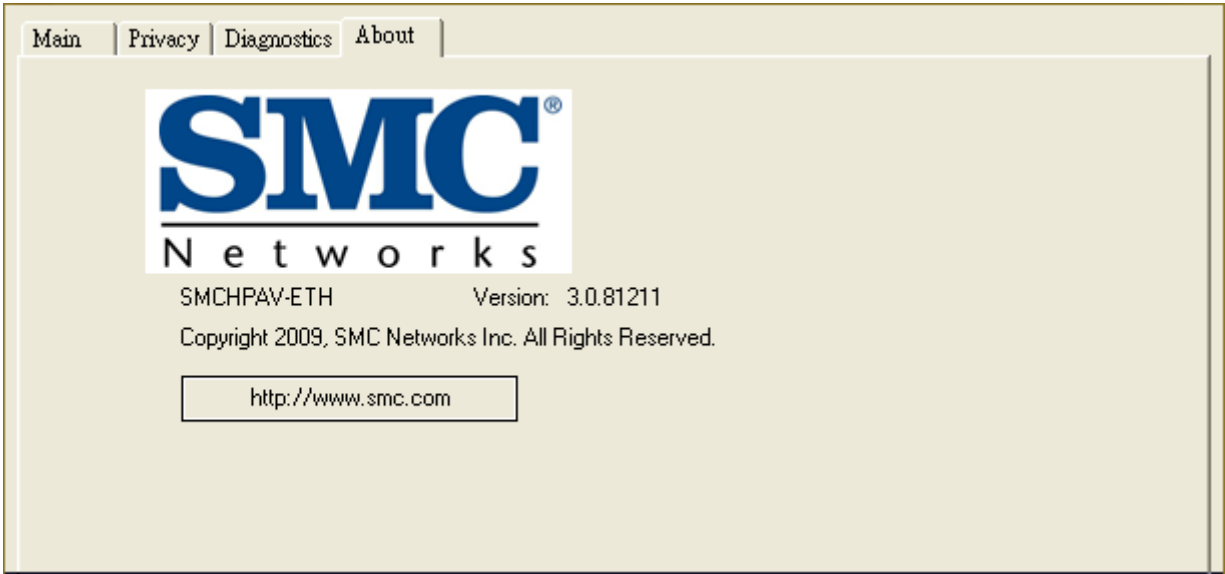


Figure 7. The About Tab Screen

Appendix

A-1.Specification

Items	Description	
PHY Rate	200Mbps	
Effect Data Rate	TCP: Up to 65 Mbps effective throughput UDP: Up to 85 Mbps effective throughput	
Frequency Band	2~28 MHz (With Mask)	
Access Methods	CSMA/CA channel-access schemes	
Qos	<ul style="list-style-type: none"> ● Four-level priority based contention access, and multi segment bursting ● 8-levels VLAN priority field, TOS Field ● QoS Classification by destination MAC address and IP Port 	
Modulation	OFDM (QAM 8/16/64/256/1024, QPSK, BPSK, ROBO)	
Standards	IEEE 802.3, IEEE 802.3u, HomePlug AV 1.1	
Operating System	Microsoft Windows® 98 SE, Me, 2000, XP, Vista, MacOS, Linux	
Nodes	Up to 63 slaves with 1 master, 64 total devices	
	4 overlapping networks for neighbor networks with CCo failover	
	Up to 4 masters with up to 252 slaves, 256 total devices in 4 AVLNs	
	Max 64 bridged devices per station	
	Up to 4096 addressable devices including bridged devices	
IGMP	Support for IPv4/IGMPv1,v2,v3 snooping Support for IPv6 and MLDv1,v2 snooping Max 16 source addresses and Group Members	
Encryption	128-bit AES Link Encryption with key management	
Push button	Security button	
	Reset button	
Port	One 10/100M Ethernet port	
Distance	AC Wire : 100 meters	
LEDs	Power (Red)	
	Link(Green/Orange/Red throughput indicator)	
	Ethernet(Green)	
Environment	Temperature	Operating : 0~40 °C
		Storage : -20~60 °C
	Relative Humidity	Operating : 10~85% Non-Condensing
		Storage : 5~90% Non-Condensing
Power Source	100 ~ 240 VAC 50/60Hz	

Power Consumption	4W Max (Normal mode) Below 2W (Standby mode)
Certification	CE / FCC

LEDs

Power LED (Red)	On: Power on Blinking: Standby mode (*1) Off: Power off
Link LED (Green/Orange/Red)	On: Powerline Link detected and no traffic Blinking: Powerline traffic detected <ul style="list-style-type: none"> ■ Green: The Powerline connection quality is good ■ Orange: The Powerline connection quality is fair ■ Red: The Powerline connection quality is bad Off: No Powerline Link detected
Ethernet LED (Green)	On: Ethernet Link detected Blinking: Ethernet traffic detected Off: No Ethernet Link detected

*1: The Power LED indicator will blink in standby mode. It will get into standby mode, if you plug the device to outlet and no Ethernet link detected after booted and 60 second later. If you unplug the Ethernet cable, it will get into standby mode after 60 seconds. **Under standby mode, Link LED and Ethernet LED will both be off.**

A-2. Push buttons

Please note that push button functions are disabled in standby mode.

※Security Button Usage:

1. First time to setup your private network:

It is highly recommended to setup a private network with encryption to protect the network from unauthorized access through the Powerline network. In a private network each device must use exactly the same private network name to be able to communicate.

Step 1. Press and hold the device's **"Security"** button for more than 10 seconds to set up a random name for the private network. You can release the button when you see all the device's LEDs are turned off and on again. The original private network name (HomePlugAV) is cleared.

Step 2. Repeat step 1 to clear another device's original private network name setting.

Step 3. Press both devices' **"Security"** button for 2 seconds. You will see both devices' **"Power"** LED start blinking. The devices start to communicate and try to setup their private network name. They will complete the process within 10 seconds. On both devices' all LEDs are turned off and on again.

Note: The setup operation timeout is 120 seconds.

Step 4. If the process to setup your private network failed, please repeat step 1 to step 3 again.

2. Add a new device to an existing private network:

Step 1. Press and hold the **"Security"** button of the new device for more than 10 seconds to clear the original private network name setting.

Step 2. Press the new device's **"Security"** button for 2 seconds. The **"Power"** LED starts blinking.

Step 3. Select a random device from the existing private network. Press its **"Security"** button for 2 seconds. The device's **"Power"** LED starts blinking.

Step 4. The new device starts to communicate with the device from the existing private network, and tries to join the existing private network. It will complete the process within 10 seconds. On the new device's all LEDs are turned off and on again. The existing private network device's "**Power**" LED become solid.

Note: The setup operation timeout is 120 seconds.

Step 5. If the process to add a new device to an existing private network failed, please repeat step 1 to step 3 again.

3. Remove a device from an existing private network:

To remove a device from existing network, press and hold the device's "**Security**" button for more than 10 seconds to clear the private network name setting and generate a new random private network name. This will remove the device from the existing private network. To recover the private network name back to default, a hardware reset is required. Please press reset button.

※Reset Button Usage:

1. Reset the device to the factory default setting:

Press the device's "**Reset**" button for 2 seconds. You will see all the device's LEDs are off and restart. The device's setting will reset to the "factory defaults".



TECHNICAL SUPPORT

From U.S.A. and Canada (24 hours a day, 7 days a week)

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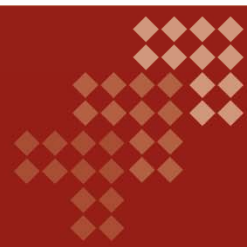
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